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DATE:	**3/28/2004**	
TO:	**Appeal Communication to Board of Appeals & Interferences**	**Group Art Unit: 2177**
COMPANY:	**United States Patent and Trademark Office**	
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FROM:	**John Biggers, Reg. No. 44,537**	
RE:	**Appeal Brief; Entitled: "Method and System for Simplifying the Use of Data Mining in domain-Specific Analytic Applications by Packaging Predefined Data Mining Models"**	**Atty. Docket No.: AUS920010258US1 (041)**
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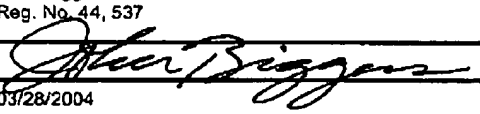
Signature	
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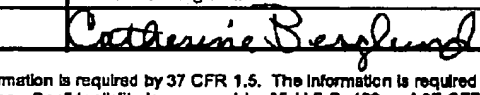
Signature		Date	03/28/2004

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AUS920010258US1
APPEAL BRIEF

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In re Application of: Prasad Rajendra Vishnubhotla.	§	Group Art Unit:	2177
Serial No.: 09/826,662	§	Examiner:	Pham, K.
Filed: April 5, 2001	§		
Title: Method and System for Simplifying the Use of Data Mining in Domain-Specific. Analytic Applications by Packaging Predefined Data Mining Models	§	Atty Docket No.:	AUS920010258US1

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APPEAL BRIEF

Honorable Commissioner:

This is an Appeal Brief filed pursuant to 37 CFR 1.92(a) in response to the Final Office Action of November 4, 2003, and pursuant to the Notice of Appeal filed February 3, 2004.

REAL PARTY IN INTEREST

The real party in interest is the patent assignee, International Business Machines Corporation ("IBM"), a New York corporation having a place of business at Armonk, New York 10504.

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RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

The pending claims are claims 1-60. All pending claims stand rejected under 35 U.S.C. 102(e). All pending claims are on appeal.

STATUS OF AMENDMENTS

No amendments were submitted after final rejection. However, a Response was submitted after Final Office Action dated November 4, 2003. The claims as currently presented are included in the Appendix of Claims that accompanies this Appeal Brief.

SUMMARY OF INVENTION

Applicants provide the following concise summary of the invention according to 37 CFR 1.192(c)(5), including references to the specification with page and line numbers and to the drawings by reference characters. Numbers in parenthesis are reference characters for Figure 1 in the drawings of the present application.

The present invention provides methods, systems, and computer program products for developing a domain-specific analytic application having at least one predefined data mining model. Typical embodiments include identifying (104) a business problem (106) to be solved, selecting (108) a data mining algorithm appropriate for solving the business problem (106), defining (110) data schema for use as inputs and outputs to and from the mining algorithm, and defining (112) a data mining model (114) (called a 'predefined data mining model') dependent upon the data schema.

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An "analytic application" is discussed in the specification at page 1, line 35. "Domain specific" is discussed beginning at line 1 on page 4 of the specification. The term "predefined data mining model" is discussed in the specification in the paragraph beginning at line 15 on page 3. "Identifying a business problem to be solved" is described beginning at page 10, line 1. "Selecting a data mining algorithm appropriate for solving the business problem" is described beginning at page 11, line 16. "Defining data schema for use as inputs and outputs to and from the mining algorithm" is described beginning at page 12, line 1. And "defining a data mining model dependent upon the data schema" is described beginning at page 14, line 1.

All such references to the specification identify descriptions and discussions that are part of the detailed descriptions of exemplary embodiments of the present invention in the present application. Such descriptions and discussions are not limitations of the claims in the present application. The only limitations of the claims are set forth in the claims themselves.

ISSUES

The issue before the board generally is whether the claims of the present application are anticipated under 35 U.S.C. 102(e) by Tamayo, US Publication Number 2002/0083067 A1. More particularly, there are two issues:

1. Whether Tamayo discloses each and every element and limitation of the claims of the present application, and

2. Whether Tamayo provides an enabling disclosure of each and every element and limitation of the claims of the present invention.

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GROUPING OF CLAIMS

The claims do not stand or fall together. More particularly, if the independent claims stand, then the dependent claims stand together with them. The independent claims, however, fall separately.

The claims include three independent claims (claims 1, 21 and 41), each of which has depending from it a group of dependent claims (claims 2-20, 22-40, and 42-60 respectively). The independent claims 1, 21, and 41 claim respectively method, system, and product aspects of developing a domain-specific analytic application having at least one predefined data mining model. If the independent claims stand, all the claims stand. Moreover, because the independent claims claim respectively method, system, and product aspects of the present invention, the independent claims all stand if claim 1 stands. If the independent claims fall, however, the dependent claims may still be patentable individually.

ARGUMENT

Applicants argue in summary:

1. Tamayo does not disclose each and every element of the claims of the present invention. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

2. Tamayo is not an enabling disclosure of the claims of the present invention. "In determining that quantum of prior art disclosure which is necessary to declare an applicant's invention 'not novel' or 'anticipated' within section 102, the stated test is whether a reference contains an 'enabling disclosure' ... We think it is sound law, consistent with the public policy underlying our patent law, that before any

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publication can amount to a statutory bar to the grant of a patent, its disclosure must be such that a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention." *In re Hoeksema*, 399 F.2d 269, 273, 158 USPQ 596, 600 (CCPA 1968).

TAMAYO DOES NOT DISCLOSE EACH AND EVERY ELEMENT OF THE CLAIMS OF THE PRESENT INVENTION

Tomayo Does Not Disclose Developing A Domain-Specific Analytic Application

Claims 1-60 are directed toward "developing a domain-specific analytic application having at least one predefined data mining model." Tomayo does not disclose "developing a domain-specific analytic application." In fact, Tomayo teaches away from developing a domain specific analytic application by discussing a heterogeneous system of enterprise web mining:

> "Enterprise web mining (EWM) in its most general realization involves the collection of data intensive data sources and repositories with corporate, warehousing, and web-transaction components. As a consequence of this heterogeneity the present invention must incorporate these data sources in a way suitable to support the three learning paradigms and also allow the system to solve different types of mining problems along the spectrum of web enterprises shown in FIG. 3."

Tomayo, paragraph [0060].

The office action of November 4, 2003, states that Tomayo discloses developing a domain specific analytic application at paragraph [0094] and Figure 10. Paragraph

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[0094] is a description of Figure 10 that describes a methodological and technical framework for enterprise web mining, making no mention of "developing a domain-specific analytic application." Unlike Tomayo's heterogeneous application, Appellant claims a method of developing a domain-specific analytic application, that is, an analytic application directed to one domain among many. Appellants' invention as claimed in claim 1 is domain-specific in that it has the capability of developing applications for many domains, one domain at a time. Tamayo does not disclose any ability to cut across domains. The notion of domain specificity is not in Tamayo in any way, shape, or form. Because Tomayo does not disclose "developing a domain-specific analytic application having at least one predefined data mining model," Tomayo does not anticipate claim 1 within the meaning of *Verdegaal*.

Tomayo Does Not Disclose Identifying A Business Problem To Be Solved and Selecting A Data Mining Algorithm Appropriate For Solving The Business Problem

Independent claim 1 claims a method of "developing a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." The Office Action dated November 11, 2004, rejects independent claim 1 on grounds that Tamayo teaches at page 5, paragraph [0059], a method of "developing a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." Paragraph [0059] is a discussion of three data mining 'paradigms,' supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system. Paragraph [0059] recites a list of business problems, but paragraph [0059] makes no mention of "developing domain-specific analytic applications," by "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." That is, the identified business problem.

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In fact, Tomayo teaches away from a domain specific application that would include "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem" according to the present invention. Tamayo instead discusses the use of a *plurality* of data mining models:

> In accordance with the present invention, a method of enterprise web mining comprises the steps of: collecting data from a plurality of data sources; integrating the collected data: generating a plurality of data mining models using the colleted data; and generating a prediction of recommendation in response to a received request for a recommendation or prediction.

Tomayo, paragraph [0007] (emphasis added).

Because Tomayo does not disclose "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem," Tomayo does not anticipate claim 1 within the meaning of *Verdegaal*.

Tamayo Does Not Disclose Defining Data Schema For Use As Inputs And Outputs

Independent claim 1 claims "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." The Office Action dated November 11, 2003, rejects independent claim 1 on grounds that Tamayo teaches at page 5, paragraph [0059], and at page 6, paragraph [0072], a method of "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." Paragraph [0059] is a general description of characteristics of input datasets as they are related to the heterogeneous application of

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data mining described in paragraph [0059]. Such a description amounts to a mere declaration that data mining algorithms utilize input datasets. In stark contrast to the general description that data mining algorithms utilize input datasets of paragraph [0059], claim 1 claims "defining data schema for use as inputs and outputs to and from the mining algorithm."

The Office Action dated November 11, 2003, rejects independent claim 1 also on grounds that Tamayo teaches at page 6, paragraph [0072], a method of "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." Paragraph [0072] however is merely a discussion of storing visitor activity of a visitor at a web site for use in building a mining model for an enterprise web application. Paragraph [0072] does not mention developing a domain-specific analytic application or defining data schema for use as inputs and outputs. Because Tomayo does not disclose "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema," Tomayo does not anticipate claim 1 within the meaning of *Verdegaal*.

Tamayo Does Not Disclose Defining A Data Mining Model Dependent Upon The Data Schema

Independent claim 1 also claims method of "developing a domain-specific analytic application" including "defining a data mining model dependent upon the data schema." The Office Action dated November 4, 2003, rejects independent claim 1 on grounds that Tamayo discloses developing domain-specific analytic application including defining a data mining model dependent upon the data schema at page 7-8, paragraphs [0088] and [0094]. Paragraph [0088] teaches neither a domain-specific analytic application nor defining a data mining model dependent upon the data schema. Instead, paragraph [0088] is a discussion of a data preprocessing engine which extracts data from web logs and other corporate information sources and transforms it into a form suitable for

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transaction based data mining in enterprise web mining.

Tamayo at [0094] is a description of a data flow diagram, Figure 10 of Tamayo, which also depicts an "enterprise web mining system 1000." Tamayo states that the enterprise web mining system 1000 includes untrained data mining models, trained data mining models, and deployed data mining models. That is, Tamayo at [0094], to the extent that it discusses data mining models, is once again a generic listing of several kinds of data mining models used in Tomayo's heterogeneous system. Because Tomayo does not disclose "defining a data mining model dependent upon the data schema," Tomayo does not anticipate claim 1 within the meaning of *Verdegaal*.

TAMAYO IS NOT AN ENABLING DISCLOSURE OF THE CLAIMS OF THE PRESENT INVENTION

There are two required aspects of anticipation. Not only must Tamayo disclose each and every element of the claims of the present invention within the meaning of *Verdegaal* in order to anticipate the claims, but also Tamayo must be an enabling disclosure of the claims of the present invention within the meaning of *In re Hoeksema*. The Appellants' claims in *Hoeksema* were rejected because an earlier patent disclosed a close structural similarity to appellant's chemical compound. The court in Hoeksema stated: "We think it is sound law, consistent with the public policy underlying our patent law, that before any publication can amount to a statutory bar to the grant of a patent, its disclosure must be such that a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention." *In re Hoeksema*, 399 F.2d 269, 273, 158 USPQ 596, 600 (CCPA 1968). The *Hoeksema* court contrasted the so-called 'Von Bramer doctrine' with the requirement for a reference to be enabling:

> In *In re Brown*, 51 CCPA 1254, 329 F.2d 1006, 141 USPQ 245 (1964), this court discussed *In re Von Bramer*, 29 CCPA 1018, 127 F.2d 149, 53 USPQ 345 (1942), commenting that that opinion should not be construed to encompass what had come to be called the "Von Bramer doctrine." There we stated, 51 CCPA at 1257,

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329 F.2d at 1009, 141 USPQ at 247:

> This doctrine which appears to have resulted from *In re Von Bramer et al., supra*, seems over a period of years to have been tailored in some quarters to a principle which defeats the novelty of a chemical compound on the basis of a mere printed conception or a mere printed contemplation of a chemical "compound" irrespective of the fact that the so-called "compound" described in the reference is not in existence or that there is no process shown in the reference for preparing the compound, or that there is no process known to a person having ordinary skill in the relevant art for preparing the compound. In other words, a mere formula or a mere sequence of letters which constitute the designation of a "compound," is considered adequate to show that a compound in an application before the Patent Office, which compound is designated by the same formula or the same sequence of letters, is old. We do not think that the Von Bramer case should be so construed.

To the extent that anyone may draw an inference from the Von Bramer case that the mere printed conception or the mere printed contemplation which constitutes the designation of a "compound" is sufficient to show that such a compound is old, regardless of whether the compound is involved in a 35 USC 102 or 35 USC 103 rejection, we totally disagree.

The meaning of *Hoeksema* for the present case is that it is insufficient as anticipation under 35 USC 102(e) for Tamayo to express a "mere printed conception" or "mere printed contemplation" of the elements of the claims of the present invention. Tamayo's description of 'heterogeneous enterprise web mining' mentions, but does not enable words, found in the present application. Tamayo's mere printed mention of words found in the present application cannot possibly be legally insufficient to show that the present invention is old. The test for sufficiency of enabling disclosure is whether it places an invention in the possession of a person of ordinary skill in the art, and Tamayo's

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discussion of heterogeneous enterprise web mining is not legally insufficient to enable one of ordinary skill in the art to develop a domain-specific analytic application having at least one predefined data mining model comprising identifying a business problem to be solved; selecting a data mining algorithm appropriate for solving the business problem; defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema; and defining a data mining model dependent upon the data schema, defining a data mining model resulting in the creation of a predefined data mining model; whereby a domain-specific analytic application is developed, the analytic application having at least one predefined data mining model.

Tomayo Does Not Enable Developing
A Domain-Specific Analytic Application

Claims 1-60 are directed toward "developing a domain-specific analytic application having at least one predefined data mining model." Tomayo does not enable "developing a domain-specific analytic application" within the meaning of *In re Hoeksema*. In fact, Tomayo teaches away from developing a domain specific analytic application by disclosing a heterogeneous system of enterprise web mining:

> "Enterprise web mining (EWM) in its most general realization involves the collection of data intensive data sources and repositories with corporate, warehousing, and web-transaction components. As a consequence of this heterogeneity the present invention must incorporate these data sources in a way suitable to support the three learning paradigms and also allow the system to solve different types of mining problems along the spectrum of web enterprises shown in FIG. 3."

Tomayo, paragraph [0060]. It is clearly impossible for a reader of skill in the art to take this description of support for "three learning paradigms" allowed to "solve different types of mining problems along the spectrum of web enterprises" from Tamayo and learn

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from it how to develop "a domain-specific analytic application having at least one predefined data mining model" according to the claims of the present invention.

The office action of November 4, 2003, states that Tomayo discloses developing a domain specific analytic application at paragraph [0094] and Figure 10. Paragraph [0094] is a description of Figure 10 that describes a methodological and technical framework for enterprise web mining, making no mention of "developing a domain-specific analytic application." Again, it is clearly impossible for a reader of skill in the art to take this description of a "framework for enterprise web mining" from Tamayo and learn from it how to develop "a domain-specific analytic application having at least one predefined data mining model" according to the claims of the present invention.

Tomayo Does Not Enable Identifying A Business Problem To Be Solved and Selecting A Data Mining Algorithm Appropriate For Solving The Business Problem

Independent claim 1 claims a method of "developing a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." The Office Action dated November 4, 2004, rejects independent claim 1 on grounds that Tamayo teaches at page 5, paragraph [0059], a method of "developing a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem."

Tamayo at page 5, paragraph [0059], does not enable "developing a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." Paragraph [0059] is a discussion of three data mining 'paradigms,' supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system. Paragraph [0059] recites a laundry list of problems, but paragraph [0059] makes no mention of "developing domain-specific analytic applications," by "identifying a business problem

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to be solved" and "selecting a data mining algorithm appropriate for solving the business problem." It is therefore clearly impossible for a reader of skill in the art to take this description of "three learning paradigms" including a laundry list of problems from Tamayo and learn from it how to develop "a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem."

Tamayo moreover cannot possibly enable a domain specific application including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem" because Tamayo actually teaches away from such a domain specific application. Tamayo instead describes the use of a plurality of data mining models:

> In accordance with the present invention, a method of enterprise web mining comprises the steps of: collecting data from a plurality of data sources; integrating the collected data: generating a plurality of data mining models using the collected data; and generating a prediction of recommendation in response to a received request for a recommendation or prediction.

Tamayo, paragraph [0007] (emphasis added).

Because a "plurality of data mining models" for "enterprise web mining" teaches away from a domain specific application, it is impossible for a reader of skill in the art to take this description from Tamayo and learn from it how to develop "a domain-specific analytic application" including "identifying a business problem to be solved" and "selecting a data mining algorithm appropriate for solving the business problem."

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Tamay D es Not Enable Defining Data Schema For Use As Inputs And Outputs

Independent claim 1 claims "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." The Office Action dated November 4, 2003, rejects independent claim 1 on grounds that Tamayo teaches at page 5, paragraph [0059], and at page 6, paragraph [0072], a method of "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema."

Paragraph [0059] and paragraph [0072] of Tamayo do not enable a method of "developing a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." Paragraph [0059] is a general description of characteristics of input datasets as they are related to the heterogeneous application of data mining described in paragraph [0059]. Such a description amounts to a mere declaration that data mining algorithms utilize input datasets, a kind of "mere printed conception" or "mere printed contemplation" within the meaning of *Hoeksema*. It is impossible for a reader of skill in the art to take this mere declaration that data mining algorithms utilize input datasets and learn from it how to develop "a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema."

Paragraph [0072] also does not enable developing "a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema." Paragraph [0072] is merely a discussion of storing visitor activity of a visitor at a web site for use in building a mining model for an enterprise web application.

Paragraph [0072] makes no mention whatsoever of developing a domain-specific analytic application or defining data schema for use as inputs and outputs. It is therefore impossible for a reader of skill in the art to take this discussion of storing visitor activity of a visitor at a web site and learn from it how to develop "a domain-specific analytic application" including "defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema."

Tamayo Does Not Enable Defining A Data Mining Model Dependent Upon The Data Schema

Independent claim 1 also claims method of "developing a domain-specific analytic application" including "defining a data mining model dependent upon the data schema." The Office Action dated November 4, 2003, rejects independent claim 1 on grounds that Tamayo discloses developing domain-specific analytic application including defining a data mining model dependent upon the data schema at page 7-8, paragraphs [0088] and [0094].

Paragraph [0088] does not enable developing "a domain-specific analytic application" including "defining a data mining model dependent upon the data schema." Paragraph [0088] teaches neither a domain-specific analytic application nor defining a data mining model dependent upon the data schema. Instead, paragraph [0088] is a discussion of a data preprocessing engine which extracts data from web logs and other corporate information sources and transforms the data into a form suitable for transaction based data mining in enterprise web mining. It is clearly impossible for a reader of skill in the art to take this discussion of a data preprocessing engine and learn from it how to develop "a domain-specific analytic application" including "defining a data mining model dependent upon the data schema."

Paragraph [0094] of Tomayo also does not enable "developing a domain-specific analytic application" including "defining a data mining model dependent upon the data schema."

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Tamayo at [0094] is a description of a data flow diagram, Figure 10 of Tamayo, which also depicts an "enterprise web mining system 1000." Tamayo states that the enterprise web mining system 1000 includes untrained data mining models, trained data mining models, and deployed data mining models. That is, Tamayo at [0094], to the extent that it discusses data mining models, is once again a generic listing of several kinds of data mining models used in Tomayo's heterogeneous system, another kind of "mere printed conception" or "mere printed contemplation" within the meaning of *Hoeksema*. It is impossible for a reader of skill in the art to take this listing of untrained data mining models, trained data mining models, and deployed data mining models and learn from it how to develop "a domain-specific analytic application" including "defining a data mining model dependent upon the data schema."

ARGUMENT REGARDING DEPENDENT CLAIMS

37 CFR 1.192(c)(7) requires Applicants to state whether claims stand or fall together. As noted above, the present claims do not stand or fall together. That is, if the independent claims stand, then the dependent claims stand together with them. The independent claims, however, fall separately. In support of its declaration that the claims fall separately, Applicants respectfully present the following arguments according to 37 CFR 1.192(c)(7) explaining why the dependent claims in the present application are separately patentable.

The Final Office Action of November 4, 2003, finally rejects claims 21-40 and claims 41-60 on the following grounds (quoting from the Final Office Action):

> **Claims 21-40** recite "a system" comprising means similar to the method of claims 1-20. Therefore, claims 21-40 are rejected by the same rational as stated in the rejection of claims 1-20 above.

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> **Claims 41-60** recite "a computer program product" comprising means similar to the method of claims 1-20. Therefore, claims 41-60 are rejected by the same rational as stated in the rejection of claims 1-20 above.

Because the dependent claims 22-40 and dependent claims 42-60 claim respectively system and product aspects of corresponding method claims 2-20, Applicants present the following arguments regarding the dependent claims in groups of corresponding method, system, and product claims, each group of which stands and falls together.

Claims 2, 22, and 42

The Final Office Action of November 4, 2003, finally rejects claims 2, 22, and 42 on the following grounds (quoting from the Final Office Action):

> **As per claim 2,** Tamayo teaches the method of claim 1 wherein the analytic application comprises the capabilities of:
>
> - production training the predefined data mining model using the historical data in the input data schema, wherein use of the capability of production training the predefined data mining model results in creation of a production trained data mining model" at page 6, [0084];
>
> - "and production scoring production data by use of the production trained data mining model" at page 6, [0073].

In response, Applicants respectfully note that paragraph [0084] in Tamayo in fact describes something called a "personalization application," including "predict what a web site visitor will probably like or buy," "recommendation engine," "recommendation engine farm," "packages," and "schedules for building packages." In fact, paragraph [0084] makes absolutely no mention whatsoever of production training or production scoring as claimed in claim 2 of the present application. Because paragraph [0084]

makes no mention of anything claimed in claim 2, paragraph [0084] neither discloses elements or limitations of claims 2, 22, or 42 within the meaning of *Verdegaal* nor enables elements or limitations of claims 2, 22, or 42 within the meaning of *Hoeksema*.

In further response, Applicants respectfully note that paragraph [0073] in Tamayo in fact further describes the so-called "personalization application," including "record certain activities," "saving data into a schema," "producing a list of products likely to be purchased by a web site visitor," and "producing a scored list of recommendations compiled from the visitors current behavior and from data in another schema." In fact, paragraph [0073] makes absolutely no mention whatsoever of production training or production scoring as claimed in claim 2 of the present application. Because paragraph [0073] makes no mention of anything claimed in claim 2, paragraph [0073] neither discloses elements or limitations of claims 2, 22, or 42 within the meaning of *Verdegaal* nor enables elements or limitations of claims 2, 22, or 42 within the meaning of *Hoeksema*.

Claims 3, 23, and 43

The Final Office Action of November 4, 2003, finally rejects claim 3 on the following grounds (quoting from the Final Office Action):

> **As per claim 3,** Tamayo teaches the method of claim 2 wherein "the capability of production training the predefined data mining model further comprises the capability of operating the predefined data mining model in training mode using end user historical data in the input data schema" at page 6, [0084].

In response, Applicants respectfully note again, as noted above, that paragraph [0084] in Tamayo in fact describes something called a "personalization application," including "predict what a web site visitor will probably like or buy," "recommendation engine," "recommendation engine farm," "packages," and "schedules for building packages." In fact, paragraph [0084] makes absolutely no mention whatsoever of operating in training

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mode as claimed in claim 3 of the present application. Because paragraph [0084] makes no mention of anything claimed in claim 3, paragraph [0084] neither discloses elements or limitations of claims 3, 23, or 43 within the meaning of *Verdegaal* nor enables elements or limitations of claims 3, 23, or 43 within the meaning of *Hoeksema*.

Claims 4, 24, and 44

The Final Office Action of November 4, 2003, finally rejects claim 4 on the following grounds (quoting from the Final Office Action):

> **As per claim 4,** Tamayo teaches the method of claim 2 wherein "the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to historical data stored in input schema" at page 6, [0084].

In response, Applicants respectfully note again, as noted above, that paragraph [0084] in Tamayo in fact describes something called a "personalization application," including "predict what a web site visitor will probably like or buy," "recommendation engine," "recommendation engine farm," "packages," and "schedules for building packages." In fact, paragraph [0084] makes absolutely no mention whatsoever of applying a production trained data mining model as claimed in claim 4 of the present application. Because paragraph [0084] makes no mention of anything claimed in claim 4, paragraph [0084] neither discloses elements or limitations of claims 4, 24, or 44 within the meaning of *Verdegaal* nor enables elements or limitations of claims 4, 24, or 44 within the meaning of *Hoeksema*.

Claims 5, 25, and 45

The Final Office Action of November 4, 2003, finally rejects claim 5 on the following grounds (quoting from the Final Office Action):

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> **As per claim 5,** Tamayo teaches the method of claim 2 wherein "the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to production data stored read from an end user's production database" at page 7-8, [0094] .

In response, Applicants respectfully note that paragraph [0094] in Tamayo in fact is a description of Figure 10 that describes a methodological and technical framework for enterprise web mining. In fact, paragraph [0094] makes absolutely no mention whatsoever of "applying the production trained data mining model to production data stored read from an end user's production database" as claimed in claim 5 of the present application. Because paragraph [0094] makes no mention of anything claimed in claim 5, paragraph [0094] neither discloses elements or limitations of claims 5, 25, or 45 within the meaning of *Verdegaal* nor enables elements or limitations of claims 5, 25, or 45 within the meaning of *Hoeksema*.

Claims 6, 26, and 46

The Final Office Action of November 4, 2003, finally rejects claim 6 on the following grounds (quoting from the Final Office Action):

> **As per claim 6,** Tamayo teaches the method of claim 1 wherein "the analytic application further comprises the capability of populating the input data schema with historical data" at page 6, [0081]-[0082].

In response, Applicants respectfully note that paragraphs [0081]-[0082] in Tamayo in fact disclose the so-called "personalization application," "registered visitors," "unregistered visitors," "a recommendation engine cache for a specific session," "sessionless web application," "dual buffer caches," "Java servers," and "flushing the data to mining table repositories." In fact, paragraphs [0081]-[0082] make absolutely no mention whatsoever of "the analytic application further comprises the capability of populating the input data

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schema with historical data" as claimed in claim 6 of the present application. Because paragraphs [0081]-[0082] make no mention of anything claimed in claim 6, paragraphs [0081]-[0082] neither disclose elements or limitations of claims 6, 26, or 46 within the meaning of *Verdegaal* nor enable elements or limitations of claims 6, 26, or 46 within the meaning of *Hoeksema*.

Claims 7, 27, and 47

The Final Office Action of November 4, 2003, finally rejects claim 7 on the following grounds (quoting from the Final Office Action):

> **As per claim 7,** Tamayo teaches the method of claim 6 wherein "the capability of populating the input data schema with historical data further comprises the capabilities of extracting from historical data values of prediction data fields and writing the values of the prediction data fields into the input data schema for the data mining model" at page 6, [0081]-[0082].

In response, Applicants respectfully note again, as noted above, that paragraphs [0081]-[0082] in Tamayo in fact disclose the so-called "personalization application," "registered visitors," "unregistered visitors," "a recommendation engine cache for a specific session," "sessionless web application," "dual buffer caches," "Java servers," and "flushing the data to mining table repositories." In fact, paragraphs [0081]-[0082] make absolutely no mention whatsoever of "extracting from historical data values of prediction data fields and writing the values of the prediction data fields into the input data schema for the data mining model" as claimed in claim 7 of the present application. Because paragraphs [0081]-[0082] make no mention of anything claimed in claim 7, paragraphs [0081]-[0082] neither disclose elements or limitations of claims 7, 27, or 47 within the meaning of *Verdegaal* nor enable elements or limitations of claims 7, 27, or 47 within the meaning of *Hoeksema*.

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Claims 8, 28, and 48

The Final Office Action of November 4, 2003, finally rejects claim 8 on the following grounds (quoting from the Final Office Action):

> **As per claim 8,** Tamayo teaches the method of claim 1 wherein "identifying a business problem to be solved further comprises identifying a business problem capable of expression through the use of referents that are defined in a specific computational domain" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "identifying a business problem capable of expression through the use of referents that are defined in a specific computational domain" as claimed in claim 8 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 8, paragraph [0059] neither discloses elements or limitations of claims 8, 28, or 48 within the meaning of *Verdegaal* nor enables elements or limitations of claims 8, 28, or 48 within the meaning of *Hoeksema*.

Claims 9, 29, and 49

The Final Office Action of November 4, 2003, finally rejects claim 9 on the following grounds (quoting from the Final Office Action):

> **As per claim 9,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a radial basis function algorithm for value prediction" at 10, [0114].

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In response, Applicants respectfully note that paragraph [0114] in Tamayo in fact is a discussion of "model generation" with "naïve Bayes algorithms," "classification and regression tree algorithms," and "association rules." In fact, paragraph [0114] makes absolutely no mention whatsoever of "selecting a radial basis function algorithm for value prediction" as claimed in claim 9 of the present application. Because paragraph [0114] makes no mention of anything claimed in claim 9, paragraph [0114] neither discloses elements or limitations of claims 9, 29, or 49 within the meaning of *Verdegaal* nor enables elements or limitations of claims 9, 29, or 49 within the meaning of *Hoeksema*.

Claims 10, 30, and 50

The Final Office Action of November 4, 2003, finally rejects claim 10 on the following grounds (quoting from the Final Office Action):

> **As per claim 10,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural value prediction algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting a neural value prediction algorithm" as claimed in claim 10 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 10, paragraph [0059] neither discloses elements or limitations of claims 10, 30, or 40 within the meaning of *Verdegaal* nor enables elements or limitations of claims 10, 30, or 40 within the meaning of *Hoeksema*.

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Claims 11, 31, and 51

The Final Office Action of November 4, 2003, finally rejects claim 11 on the following grounds (quoting from the Final Office Action):

> **As per claim 11,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a demographic clustering algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting a demographic clustering algorithm" as claimed in claim 11 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 11, paragraph [0059] neither discloses elements or limitations of claims 11, 31, or 51 within the meaning of *Verdegaal* nor enables elements or limitations of claims 11, 31, or 51 within the meaning of *Hoeksema*.

Claims 12, 32, and 52

The Final Office Action of November 4, 2003, finally rejects claim 12 on the following grounds (quoting from the Final Office Action):

> **As per claim 12,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural clustering algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business

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problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting a neural clustering algorithm" as claimed in claim 12 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 12, paragraph [0059] neither discloses elements or limitations of claims 12, 32, or 52 within the meaning of *Verdegaal* nor enables elements or limitations of claims 12, 32, or 52 within the meaning of *Hoeksema*.

Claims 13, 33, and 53

The Final Office Action of November 4, 2003, finally rejects claim 13 on the following grounds (quoting from the Final Office Action):

> **As per claim 13,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a tree classification algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting a tree classification algorithm" as claimed in claim 13 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 13, paragraph [0059] neither discloses elements or limitations of claims 13, 33, or 53 within the meaning of *Verdegaal* nor enables elements or limitations of claims 13, 33, or 53 within the meaning of *Hoeksema*.

Claims 14, 34, and 54

The Final Office Action of November 4, 2003, finally rejects claim 14 on the following grounds (quoting from the Final Office Action):

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> **As per claim 14,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural classification algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting a neural classification algorithm" as claimed in claim 14 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 14, paragraph [0059] neither discloses elements or limitations of claims 14, 34, or 54 within the meaning of *Verdegaal* nor enables elements or limitations of claims 14, 34, or 54 within the meaning of *Hoeksema*.

Claims 15, 35, and 55

The Final Office Action of November 4, 2003, finally rejects claim 15 on the following grounds (quoting from the Final Office Action):

> **As per claim 15,** Tamayo teaches the method of claim 1 wherein "selecting a mining algorithm appropriate for solving the business problem further comprises selecting an associations algorithm" at page 5, [0059].

In response, Applicants respectfully note that paragraph [0059] in Tamayo in fact is a discussion of three data mining "paradigms," supervised learning, association analysis, and clustering used in Tomayo's heterogeneous system, along with a list of business problems. In fact, paragraph [0059] makes absolutely no mention whatsoever of "selecting an associations algorithm" as claimed in claim 15 of the present application. Because paragraph [0059] makes no mention of anything claimed in claim 15, paragraph [0059] neither discloses elements or limitations of claims 15, 35, or 55 within the

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meaning of *Verdegaal* nor enables elements or limitations of claims 15, 35, or 55 within the meaning of *Hoeksema*.

Claims 16, 36, and 56

The Final Office Action of November 4, 2003, finally rejects claim 2 on the following grounds (quoting from the Final Office Action):

> **As per claim 16,** Tamayo teaches the method of claim 1 wherein "defining data schema for the mining algorithm further comprises the steps of: selecting from historical data for inclusion in input data schema predictor fields capable of supporting the use of a data mining algorithm in predicting the value of a prediction field; and selecting for inclusion in output data schema at least one prediction field"at page 6, [0081]-[0082].

In response, Applicants respectfully note again, as noted above, that paragraphs [0081]-[0082] in Tamayo in fact disclose the so-called "personalization application," "registered visitors," "unregistered visitors," "a recommendation engine cache for a specific session," "sessionless web application," "dual buffer caches," "Java servers," and "flushing the data to mining table repositories." In fact, paragraphs [0081]-[0082] make absolutely no mention whatsoever of " selecting from historical data for inclusion in input data schema predictor fields capable of supporting the use of a data mining algorithm in predicting the value of a prediction field; and selecting for inclusion in output data schema at least one prediction field" as claimed in claim 16 of the present application. Because paragraphs [0081]-[0082] make no mention of anything claimed in claim 16, paragraphs [0081]-[0082] neither disclose elements or limitations of claims 16, 36, or 56 within the meaning of *Verdegaal* nor enable elements or limitations of claims 16, 36, or 56 within the meaning of *Hoeksema*.

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Claims 17, 37, and 57

The Final Office Action of November 4, 2003, finally rejects claim 17 on the following grounds (quoting from the Final Office Action):

> **As per claim 17,** Tamayo teaches the method of claim 1 wherein "defining data schema for the mining algorithm further comprises selecting for inclusion in output schema sufficient key fields to comprise a unique key for identification in production data of storage locations for the output data from the data mining algorithm" at page 15, [0219].

In response, Applicants respectfully note that paragraph [0219] in Tamayo in fact is a discussion of a "nontransactional data format." In fact, paragraph [0219] makes absolutely no mention whatsoever of "selecting an associations algorithm" as claimed in claim 17 of the present application. Because paragraph [0219] makes no mention of anything claimed in claim 17, paragraph [0219] neither discloses elements or limitations of claims 17, 37, or 57 within the meaning of *Verdegaal* nor enables elements or limitations of claims 17, 37, or 57 within the meaning of *Hoeksema*.

Claims 18, 38, and 58

The Final Office Action of November 4, 2003, finally rejects claim 18 on the following grounds (quoting from the Final Office Action):

> **As per claim 18,** Tamayo teaches the method of claim 1 wherein "defining a data mining model based on the data schema further comprises establishing in a data structure comprising the data mining model definition values for fields defining the model" at page 14, [0173-0207]].

In response, Applicants respectfully note that paragraphs [0173]-[0207] in Tamayo in fact discloses "data mining objects," "attributes," "product," "customer," and "tables." In

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fact, paragraphs [0173]-[0207] make absolutely no mention whatsoever of "establishing in a data structure comprising the data mining model definition values for fields defining the model" as claimed in claim 18 of the present application. Because paragraphs [0173]-[0207] make no mention of anything claimed in claim 18, paragraphs [0173]-[0207] neither disclose elements or limitations of claims 18, 38, or 58 within the meaning of *Verdegaal* nor enable elements or limitations of claims 18, 38, or 58 within the meaning of *Hoeksema*.

Claims 19, 39, and 59

The Final Office Action of November 4, 2003, finally rejects claim 19 on the following grounds (quoting from the Final Office Action):

> **As per claim 19,** Tamayo teaches the method of claim 18 wherein fields defining the model comprise:
>
> - "a field representing the number of consecutive records to select from the input data schema to be used for training" at page 10, [0114];
> - "a field representing the number of consecutive records to select from the input data schema to be used for development scoring" at page 12, [0152];
> - "a field limiting the number of times the data mining model goes through its input data in training mode" at page 12, [0148];
> - "a field limiting the number of fitting centers created by the mining data mining algorithm at each pass through the input data" at page 11, [0128]-[0136];
> - "a field indicating the minimum number of records to be assigned to a region" at Col. 12, [0151];

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- "a field identifying at least one predictor field; and a field identifying a prediction field" at page 12, [0146].

In response, Applicants respectfully note that paragraph [0114] in Tamayo in fact is a discussion of "model generation" with "naïve Bayes algorithms," "classification and regression tree algorithms," and "association rules." In fact, paragraph [0114] makes absolutely no mention whatsoever of "a field representing the number of consecutive records to select from the input data schema to be used for training" as claimed in claim 19 of the present application. Because paragraph [0114] makes no mention of anything claimed in claim 19, paragraph [0114] neither discloses elements or limitations of claims 19, 39, or 59 within the meaning of *Verdegaal* nor enables elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraph [0152] in Tamayo in fact is a discussion of clustering analysis in the context of class discovery. In fact, paragraph [0152] makes absolutely no mention whatsoever of "a field representing the number of consecutive records to select from the input data schema to be used for development scoring" as claimed in claim 19 of the present application. Because paragraph [0152] makes no mention of anything claimed in claim 19, paragraph [0152] neither discloses elements or limitations of claims 19, 39, or 59 within the meaning of *Verdegaal* nor enables elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraph [0148] in Tamayo in fact is a discussion of a supervised learning models constructed off-line and used for batch scoring for on-line prediction. In fact, paragraph [0148] makes absolutely no mention whatsoever of "a field limiting the number of times the data mining model goes through its input data in training mode" as claimed in claim 19 of the present application. Because paragraph [0148] makes no mention of anything claimed in claim 19, paragraph [0148] neither discloses elements or limitations of claims 19, 39, or 59 within the

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meaning of *Verdegaal* nor enables elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraphs [0128]-[0136] in Tamayo in fact discloses the lift for a binary classification model as produced by naïve Bayes algorithm. In fact, paragraphs [0128]-[0136] make absolutely no mention whatsoever of "a field limiting the number of fitting centers created by the mining data mining algorithm at each pass through the input data" as claimed in claim 19 of the present application. Because paragraphs [0128]-[0136] make no mention of anything claimed in claim 19, paragraphs [0128]-[0136] neither disclose elements or limitations of claims 19, 39, or 59 within the meaning of *Verdegaal* nor enable elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraph [0151] in Tamayo in fact is a discussion of a rules of market basket analysis. In fact, paragraph [0151] makes absolutely no mention whatsoever of "a field indicating the minimum number of records to be assigned to a region" as claimed in claim 19 of the present application. Because paragraph [0151] makes no mention of anything claimed in claim 19, paragraph [0151] neither discloses elements or limitations of claims 19, 39, or 59 within the meaning of *Verdegaal* nor enables elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraph [0146] in Tamayo in fact is a discussion of supervised learning modeling. In fact, paragraph [0146] makes absolutely no mention whatsoever of "a field identifying at least one predictor field; and a field identifying a prediction field" as claimed in claim 19 of the present application. Because paragraph [0146] makes no mention of anything claimed in claim 19, paragraph [0146] neither discloses elements or limitations of claims 19, 39, or 59 within the meaning of *Verdegaal* nor enables elements or limitations of claims 19, 39, or 59 within the meaning of *Hoeksema*.

Claims 20, 40, and 60

The Final Office Action of November 4, 2003, finally rejects claim 20 on the following grounds (quoting from the Final Office Action):

> **As per claim 20,** Tamayo teaches the method of claim 1 wherein defining a data mining model based on the data schema further comprises the steps of:
>
> - "establishing in a data structure comprising the data mining model definition values for fields defining the model" at page 10, [0114];
>
> - "development scoring historical data wherein test output data is created; and testing the test output data for accuracy wherein an accuracy valuation is created" at page 6, [0071]-[0073];
>
> - "wherein the steps of establishing definition values, development scoring, and testing are repeated until the accuracy valuation meets a predetermined accuracy requirement" at page 10, [0125].

In response, Applicants respectfully note that paragraph [0114] in Tamayo in fact is a discussion of "model generation" with "naïve Bayes algorithms," "classification and regression tree algorithms," and "association rules." In fact, paragraph [0114] makes absolutely no mention whatsoever of "establishing in a data structure comprising the data mining model definition values for fields defining the model" as claimed in claim 20 of the present application. Because paragraph [0114] makes no mention of anything claimed in claim 20, paragraph [0114] neither discloses elements or limitations of claims 20, 40, or 60 within the meaning of *Verdegaal* nor enables elements or limitations of claims 20, 40, or 60 within the meaning of *Hoeksema*.

In further response, Applicants respectfully note that paragraphs [0071]-[0073] in Tamayo in fact further describe the so-called "personalization application," including

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"record certain activities," "saving data into a schema," "producing a list of products likely to be purchased by a web site visitor," and "producing a scored list of recommendations compiled from the visitors current behavior and from data in another schema." In fact, paragraphs [0071]-[0073] make absolutely no mention whatsoever of "development scoring historical data wherein test output data is created; and testing the test output data for accuracy wherein an accuracy valuation is created" as claimed in claim 20 of the present application. Because paragraphs [0071]-[0073] make no mention of anything claimed in claim 20, paragraphs [0071]-[0073] neither disclose elements or limitations of claims 20, 40, or 60 within the meaning of *Verdegaal* nor enable elements or limitations of claims 20, 40, or 60 within the meaning of *Hoeksema*.

In response, Applicants respectfully note that paragraph [0125] in Tamayo in fact is a discussion of model testing where a classification test result includes a confusion matrix. In fact, paragraph [0125] makes absolutely no mention whatsoever of "wherein the steps of establishing definition values, development scoring, and testing are repeated until the accuracy valuation meets a predetermined accuracy requirement" as claimed in claim 20 of the present application. Because paragraph [0125] makes no mention of anything claimed in claim 20, paragraph [0125] neither discloses elements or limitations of claims 20, 40, or 60 within the meaning of *Verdegaal* nor enables elements or limitations of claims 20, 40, or 60 within the meaning of *Hoeksema*.

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CONCLUSION

In view of the forgoing arguments, reversal on all grounds of rejection is requested.

The Commissioner is hereby authorized to charge or credit Deposit Account No. 09-0447 for any fees required or overpaid.

Respectfully submitted,

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APPENDIX OF CLAIMS
ON APPEAL IN PATENT APPLICATION OF
PRASAD RAJENDRA VISHNUBHOTLA, SERIAL NO. 09/826,662

CLAIMS

What is claimed is:

1. A method of developing a domain-specific analytic application having at least one predefined data mining model, the method comprising the steps of:

identifying a business problem to be solved;

selecting a data mining algorithm appropriate for solving the business problem;

defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema; and

defining a data mining model dependent upon the data schema, defining a data mining model resulting in the creation of a predefined data mining model;

whereby a domain-specific analytic application is developed, the analytic application having at least one predefined data mining model.

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2. The method of claim 1 wherein the analytic application comprises the capabilities of:

production training the predefined data mining model using the historical data in the input data schema, wherein use of the capability of production training the predefined data mining model results in creation of a production trained data mining model; and

production scoring production data by use of the production trained data mining model.

3. The method of claim 2 wherein the capability of production training the predefined data mining model further comprises the capability of operating the predefined data mining model in training mode using end user historical data in the input data schema.

4. The method of claim 2 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to historical data stored in input schema.

5. The method of claim 2 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to production data stored read from an end user's production database.

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6. The method of claim 1 wherein the analytic application further comprises the capability of populating the input data schema with historical data.

7. The method of claim 6 wherein the capability of populating the input data schema with historical data further comprises the capabilities of extracting from historical data values of prediction data fields and writing the values of the prediction data fields into the input data schema for the data mining model.

8. The method of claim 1 wherein identifying a business problem to be solved further comprises identifying a business problem capable of expression through the use of referents that are defined in a specific computational domain.

9. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a radial basis function algorithm for value prediction.

10. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural value prediction algorithm.

11. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a demographic clustering algorithm.

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12. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural clustering algorithm.

13. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a tree classification algorithm.

14. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting a neural classification algorithm.

15. The method of claim 1 wherein selecting a mining algorithm appropriate for solving the business problem further comprises selecting an associations algorithm.

16. The method of claim 1 wherein defining data schema for the mining algorithm further comprises the steps of:

selecting from historical data for inclusion in input data schema predictor fields capable of supporting the use of a data mining algorithm in predicting the value of a prediction field; and

selecting for inclusion in output data schema at least one prediction field.

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17. The method of claim 1 wherein defining data schema for the mining algorithm further comprises selecting for inclusion in output schema sufficient key fields to comprise a unique key for identification in production data of storage locations for the output data from the data mining algorithm.

18. The method of claim 1 wherein defining a data mining model based on the data schema further comprises establishing in a data structure comprising the data mining model definition values for fields defining the model.

19. The method of claim 18 wherein fields defining the model comprise:
field representing the number of consecutive records to select from the input data schema to be used for training;

a field representing the number of consecutive records to select from the input data schema to be used for development scoring;

a field limiting the number of times the data mining model goes through its input data in training mode;

a field limiting the number of fitting centers created by the mining data mining algorithm at each pass through the input data;

a field indicating the minimum number of records to be assigned to a region;

a field identifying at least one predictor field; and

a field identifying a prediction field.

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20. The method of claim 1 wherein defining a data mining model based on the data schema further comprises the steps of:

establishing in a data structure comprising the data mining model definition values for fields defining the model; and

development scoring historical data wherein test output data is created; and

testing the test output data for accuracy wherein an accuracy valuation is created;

wherein the steps of establishing definition values, development scoring, and testing are repeated until the accuracy valuation meets a predetermined accuracy requirement.

21. A system for developing a domain-specific analytic application having at least one predefined data mining model, the system comprising:

means for identifying a business problem to be solved;

means for selecting a data mining algorithm appropriate for solving the business problem;

means for defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema; and

means for defining a data mining model dependent upon the data schema, wherein use of the means for defining a data mining model results in creation of a predefined data mining model;

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wherein use of the said means for identifying a business problem, means for selecting a data mining algorithm, means for defining data schema, and means for defining a data mining model results in development of a domain-specific analytic application, the analytic application having at least one predefined data mining model.

22. The system of claim 21 wherein the analytic application comprises the capabilities of:

production training the predefined data mining model using the historical data in the input data schema, wherein use of the capability of production training the predefined data mining model results in creation of a production trained data mining model; and

production scoring production data by use of the production trained data mining model.

23. The system of claim 22 wherein the capability of production training the data mining model further comprises the capability of operating the data mining model in training mode using end user historical data in the input data schema.

24. The system of claim 22 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to historical data stored in input schema.

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25. The system of claim 22 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to production data stored read from an end user's production database.

26. The system of claim 21 wherein the analytic application further comprises the capability of populating the input data schema with historical data.

27. The system of claim 26 wherein the capability of populating the input data schema with historical data further comprises the capabilities of extracting from historical data values of prediction data fields and writing the values of the prediction data fields into the input data schema for the data mining model.

28. The system of claim 21 wherein means for identifying a business problem to be solved further comprises means for identifying a business problem capable of expression through the use of referents that are defined in a specific computational domain.

29. The system of claim 21 wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a radial basis function algorithm for value prediction.

30. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a neural value prediction algorithm.

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31. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a demographic clustering algorithm.

32. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a neural clustering algorithm.

33. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a tree classification algorithm.

34. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting a neural classification algorithm.

35. The system of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means for selecting an associations algorithm.

36. The system of claim 21wherein means for defining data schema for the mining algorithm further comprises:

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means for selecting from historical data for inclusion in input data schema predictor fields capable of supporting the use of a data mining algorithm in predicting the value of a prediction field; and

means for selecting for inclusion in output data schema at least one prediction field.

37. The system of claim 21wherein means for defining data schema for the mining algorithm further comprises means for selecting for inclusion in output schema sufficient key fields to comprise a unique key for identification in production data of storage locations for the output data from the data mining algorithm.

38. The system of claim 21wherein means for defining a data mining model based on the data schema further comprises means for establishing in a data structure comprising the data mining model definition values for fields defining the model.

39. The system of claim 38 wherein fields defining the model comprise:

a field representing the number of consecutive records to select from the input data schema to be used for training;

a field representing the number of consecutive records to select from the input data schema to be used for development scoring;

a field limiting the number of times the data mining model goes through its input data in training mode;

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a field limiting the number of fitting centers created by the mining data mining algorithm at each pass through the input data;

a field indicating the minimum number of records to be assigned to a region;

a field identifying at least one predictor field; and

a field identifying a prediction field.

40. The system of claim 21 wherein means for defining a data mining model based on the data schema further comprises:

means for establishing in a data structure comprising the data mining model definition values for fields defining the model; and

means for development scoring historical data wherein test output data is created; and

means for testing the test output data for accuracy wherein an accuracy valuation is created;

wherein the means for establishing definition values, means for development scoring, and means for testing are capable of repeated use until the accuracy valuation meets a predetermined accuracy requirement.

41. A computer program product for developing a domain-specific analytic application having at least one predefined data mining model, the computer program product comprising:

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a recording medium;

means, recorded on the recording medium, for identifying a business problem to be solved;

means, recorded on the recording medium, for selecting a data mining algorithm appropriate for solving the business problem;

means, recorded on the recording medium, for defining data schema for use as inputs and outputs to and from the mining algorithm, the data schema including input data schema and output data schema; and

means, recorded on the recording medium, for defining a data mining model dependent upon the data schema, wherein use of the means for defining a data mining model results in creation of a predefined data mining model;

wherein use of the said means for identifying a business problem, means for selecting a data mining algorithm, means for defining data schema, and means for defining a data mining model results in development of a domain-specific analytic application, the analytic application having at least one predefined data mining model.

42. The computer program product of claim 21 wherein the analytic application comprises the capabilities of:

production training the predefined data mining model using the historical data in the input data schema, wherein use of the capability of production training the predefined data mining model results in creation of a production trained data mining model; and

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production scoring production data by use of the production trained data mining model.

43. The computer program product of claim 22 wherein the capability of production training the data mining model further comprises the capability of operating the data mining model in training mode using end user historical data in the input data schema.

44. The computer program product of claim 22 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to historical data stored in input schema.

45. The computer program product of claim 22 wherein the capability of production scoring production data by use of the production trained data mining model further comprises the capability of applying the production trained data mining model to production data stored read from an end user's production database.

46. The computer program product of claim 21 wherein the analytic application further comprises the capability of populating the input data schema with historical data.

47. The computer program product of claim 26 wherein the capability of populating the input data schema with historical data further comprises the capabilities of extracting from historical data values of prediction data fields and writing the

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values of the prediction data fields into the input data schema for the data mining model.

48. The computer program product of claim 21 wherein means for identifying a business problem to be solved further comprises means, recorded on the recording medium, for identifying a business problem capable of expression through the use of referents that are defined in a specific computational domain.

49. The computer program product of claim 21 wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a radial basis function algorithm for value prediction.

50. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a neural value prediction algorithm.

51. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a demographic clustering algorithm.

52. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a neural clustering algorithm.

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53. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a tree classification algorithm.

54. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting a neural classification algorithm.

55. The computer program product of claim 21wherein means for selecting a mining algorithm appropriate for solving the business problem further comprises means, recorded on the recording medium, for selecting an associations algorithm.

56. The computer program product of claim 21wherein means for defining data schema for the mining algorithm further comprises:

means, recorded on the recording medium, for selecting from historical data for inclusion in input data schema predictor fields capable of supporting the use of a data mining algorithm in predicting the value of a prediction field; and

means, recorded on the recording medium, for selecting for inclusion in output data schema at least one prediction field.

57. The computer program product of claim 21wherein means for defining data schema for the mining algorithm further comprises means, recorded on the recording medium, for selecting for inclusion in output schema sufficient key

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fields to comprise a unique key for identification in production data of storage locations for the output data from the data mining algorithm.

58. The computer program product of claim 21wherein means for defining a data mining model based on the data schema further comprises means, recorded on the recording medium, for establishing in a data structure comprising the data mining model definition values for fields defining the model.

59. The computer program product of claim 38 wherein fields defining the model comprise:

a field representing the number of consecutive records to select from the input data schema to be used for training;

a field representing the number of consecutive records to select from the input data schema to be used for development scoring;

a field limiting the number of times the data mining model goes through its input data in training mode;

a field limiting the number of fitting centers created by the mining data mining algorithm at each pass through the input data;

a field indicating the minimum number of records to be assigned to a region;

a field identifying at least one predictor field; and

a field identifying a prediction field.

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60. The computer program product of claim 21wherein means for defining a data mining model based on the data schema further comprises:

means, recorded on the recording medium, for establishing in a data structure comprising the data mining model definition values for fields defining the model; and

means, recorded on the recording medium, for development scoring historical data wherein test output data is created; and

means, recorded on the recording medium, for testing the test output data for accuracy wherein an accuracy valuation is created;

wherein the means for establishing definition values, means for development scoring, and means for testing are capable of repeated use until the accuracy valuation meets a predetermined accuracy requirement.

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